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states:(71) Applicant: **NEC CORP**(72) Inventor: **MIYAMOTO TAKASHI**

(74) Representative:

**(54) SEMICONDUCTOR
DEVICE**

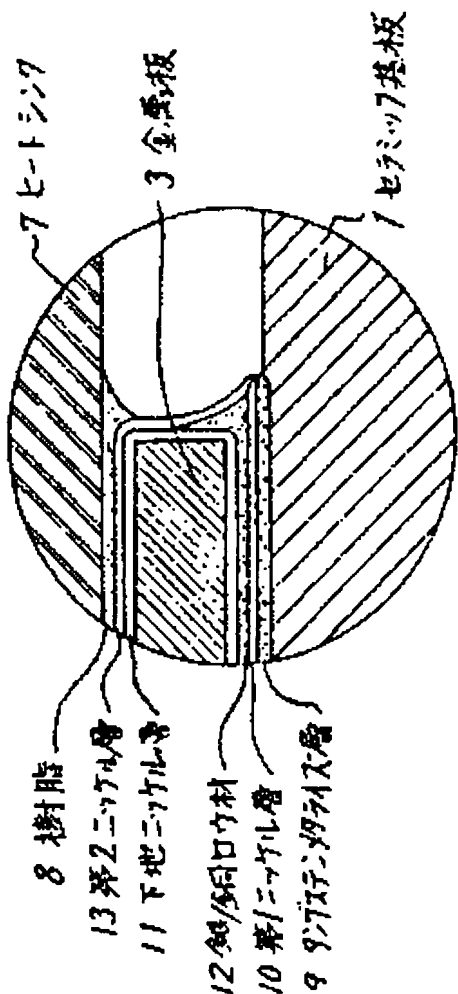
(57) Abstract:

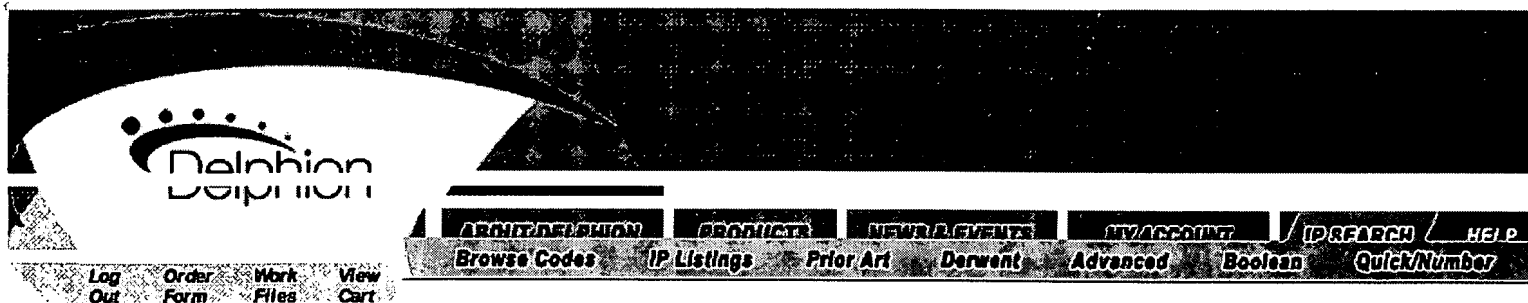
PURPOSE: To improve a bonding strength by a method wherein a nickel layer is made to be employed as a metallic face to which a heat sink is to be bonded.

CONSTITUTION: A metallic plate 3 is so brazed as to cover a through-hole provided to the center of a ceramic substrate 1 of a semiconductor device provided with a heat sink, a semiconductor element is fixed to the recessed part of the rear of the plate 3, and a heat sink is bonded to the top surface of the plate 3. The metallic plate 3 provided with a primary nickel layer 11 on it is brazed to a first nickel layer 10, which is formed on a tungsten metallized layer 9 built on the substrate 1, using a silver/copper brazing material 12, and a second nickel layer 13 and a gold plated layer are formed through electroplating, then the gold plated layer is removed and a heat sink 7 is made to be directly bonded to the nickel layer 13 using a resin 8. In this

process, a adhesive seal or a film material is applied onto the part of the nickel layer 13 to which the heat sink 7 is made to be bonded and then a gold plating is performed, then a required part of the nickel layer 13 is made to be exposed. Or a gold plating is performed onto the whole face, and then gold plated on the required part is removed through etching.

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Title: **JP1073750A2: SEMICONDUCTOR DEVICE**
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Country: **JP** Japan
 Kind: **A**

Inventor(s): **MIYAMOTO TAKASHI**

Applicant/Assignee: **NEC CORP**
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Issued/Filed Dates: **March 20, 1989 / Sept. 16, 1987**

Application Number: **JP1987000233108**

IPC Class: **H01L 23/34; H01L 23/40;**

Priority Number(s): **Sept. 16, 1987 JP1987000233108**
Aug. 31, 1999 JP1999000245110

Abstract:



Purpose: To improve a bonding strength by a method wherein a nickel layer is made to be employed as a metallic face to which a heat sink is to be bonded.

Constitution: A metallic plate 3 is so brazed as to cover a through-hole provided to the center of a ceramic substrate 1 of a semiconductor device provided with a heat sink, a semiconductor element is fixed to the recessed part of the rear of the plate 3, and a heat sink is bonded to the top surface of the plate 3. The metallic plate 3 provided with a primary nickel layer 11 on it is brazed to a first nickel layer 10, which is formed on a tungsten metallized layer 9 built on the substrate 1, using a silver/copper brazing material 12, and a second nickel layer 13 and a gold plated layer are formed through electroplating, then the gold plated layer is removed and a heat sink 7 is made to be directly bonded to the nickel layer 13 using a resin 8. In this process, an adhesive seal or a film material is applied onto the part of the nickel layer 13 to which the heat sink 7 is made to be bonded and then a gold plating is performed, then a required part of the nickel layer 13 is made to be exposed. Or a gold plating is performed onto the whole face, and then gold plated on the required part is removed through etching.

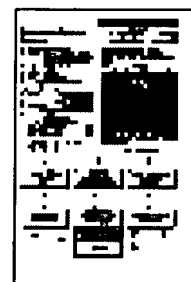
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Other Abstract Info: **DERABS G2001-184498**

Foreign References: **No patents reference this one**



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